

DETAILED ACTION

Claim Objections

1. Claim 15 is objected to because of the following informalities: The status given for Claim 15 in the claim set filed 10/03/2011 is “currently amended” but there do not appear to have been any amendments since the claim set filed 02/27/2011. Furthermore, the remarks filed 10/03/2011 note that the claim set has only been amended to clarify the status of claim 18 (page 13, section III). Examiner therefor considers the status of claim 15 to be “previously presented”. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 15, 18-24, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlier (US 6271272) further in view of Harclerode (US 5240657) and Berghmans (US 6538042) as evidenced by “Paraffin” (www.wikipedia.com) and “Primol 352” (www.protoninter.com) (all of record).

5. With respect to claim 15, Carlier teaches:

Pre-expanded beads having a bulk density chosen from a range of from 40 to 190 g/l (“before molding, the expanded beads generally have a bulk density of 7 to 50 kg/m³”, column 11, lines 38-39) and containing by weight:

(a) 100 parts of a polymer of styrene, (“100 parts by weight of the styrene polymer”, column 11, lines 30-31) having a mean molecular mass by weight Mw chosen from a range of from 180,000 to 250,000 (“the weight-average molecular mass, Mw, of the styrene polymer generally lies between 150,000 and 300,000”, column 5, lines 23-24) ...

(b) from 0.5 to less than 3.0 parts of at least one blowing agent and (“from 0.5 to 6 parts by weight of the blowing agent”, column 11, lines 31-32)

(c) from 0 to 0.4 part of at least one plasticising agent, (“from 0.1 to less than 1.0...of the petroleum wax”, column 11, lines 32-34) ...

(d) less than 400ppm of residual styrene monomer (“low residual monomer content...les than 800 ppm or even 600ppm”, column 5, lines 26-30)

wherein the pre-expanded beads are expandable. (“materials obtained ... from the expanded beads mentioned above, may be expanded moulded parts of any geometrical shape and of any volume”, column 11, lines 40-43)

6. Carlier does not specifically teach a blowing agent composition at the pre-expanded stage or explicitly teach that the pre-expanded beads would be capable of further expansion, however examiner considers that these limitations would inherently be met as evidenced by Harclerode which is used as evidence only in response to applicants argument regarding these points.

7. Harclerode shows that only a small amount of blowing agent is lost in a typical expansion process (example 16, column 24, line 54 to column 25, line 15, Table 2) and

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that a significant amount of blowing agent remains even after a polystyrene bead has been pre-expanded and subsequently molded (table 2). Thus a pre-expanded bead with the blowing agent composition taught by Carlier would inherently retain enough blowing agent after a pre-expansion step to meet the limitation of the instant claim.

8. Also, the presence of remaining blowing agent indicates that the bead would be capable of additional expansion. Further more Harclerode also teaches that "molding is effectuated by placing preexpanded beads into a mold, closing the mold so that a substantially confined volume is produced and thereafter further heating the preexpanded beads so that they further expand and substantially fill the volume within the mold and fuse" (column 14, lines 25-30) showing that it is known in the art that preexpanded beads are capable of further expansion.

9. Carlier does not teach a specific $M_w:M_n$ ratio or the use of oil as a plasticizing agent.

10. In the same field of endeavor, expanded polystyrene, Harclerode further teaches the use of polymers which have "a weight average molecular weight of from greater than 180,000 to about 300,000" (column 3, lines 17-19 – examiner notes that this is substantially identical to the range taught by Carlier) and "a polydispersity (which is defined as M_w/M_n) of from about 1 to less than 2.5" (column 17, lines 42-43) for the purpose of producing expanded beads. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a polymer with a ratio as taught by Harclerode for the purpose of producing expanded beads.

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11. In the same field of endeavor, expanded polystyrene, Berghmans teaches the use of white oil as a plasticizer (column 6, line 23). Examiner considers that it would have been obvious to one of ordinary skill in the art to substitute white oil (also known as mineral oil) as taught by Berghmans for the petroleum wax of Carlier (paraffin wax, column 5, lines 61-65) because they are recognized by the art to be from the same family of materials (evidenced by "Paraffin", page 1, paragraph 0002 – "mineral oil appears as liquids at room temperature. The solid forms of paraffin, called paraffin wax..."). It has been held to be obvious to one of ordinary skill to pursue known options when it does no more than yield predictable results. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385.

12. Furthermore, examiner considers that the instantly claimed oil properties are the standard properties of mineral oils as evidenced by "Paraffin" and "Primol 352".

"Paraffin" teaches that mineral oils are a mixture of heavier alkanes with a density of around 0.8 g/cm³. (page 2, paragraph 0001) "Primol 352", in the table on page 4, teaches a mineral oil with a hydrocarbon average, dynamic viscosity and density as instantly claimed. Therefor the combination as applied above teaches the use of an oil with the instantly claimed properties as a plasticizer.

13. With respect to claims 18 and 29, Carlier further teaches that a mixture of n-pentane and iso-pentane maybe used as the blowing agent (column 5, lines 31-35).

14. With respect to claims 19 and 20, Carlier teaches "from 0.5 to 6 parts by weight of the blowing agent" (column 11, lines 31-32).

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15. With respect to claim 21 and 22, Carlier further teaches “from 0 to 1.0 part by weight of a nucleating agent chosen from synthetic Fischer-Tropsch or polyolefin waxes” (column 4, lines 35-36).

16. With respect to claim 23, Carlier further teaches “the beads of expandable styrene polymer may have a diameter of 0.2 to 3.0 mm” (column 5, lines 4-5).

17. With respect to claim 24, Carlier teaches “the expanded beads generally have a bulk density of 7 to 50 kg/m³” (column 11, lines 38-39).

18. With respect to claim 27, as explained in the rejection of claim 15, the preexpanded beads taught by Carlier would retain sufficient blowing agent to be capable of further expansion without adding new blowing agent.

Response to Arguments

19. Applicant's arguments filed 10/03/2011 have been fully considered but they are not persuasive.

20. Applicant argues that one of ordinary skill would have Carlier to teach that reducing blowing agent concentration requires increasing plasticizer concentration and that both of these levels fall outside of the claimed ranges (page 9, lines 4-10).

21. Examiner finds this argument to be unpersuasive. Furthermore, this argument has been previously addressed (see paragraph 0020 of the Non-Final Rejection mailed 04/01/2011).

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22. Applicant further argues that Carlier considers 600 ppm to be very close to the smallest amount of residual styrene monomer which can be achieved. (page 9, line 15 to page 10, line 6).

23. Examiner finds this argument to be unpersuasive. Furthermore, this argument has been previously addressed (see paragraph 0022 of the Non-Final Rejection mailed 04/01/2011).

24. Applicant argues that “there would have been no motivation for one of ordinary skill to select from the broader Carlier range a narrower range of 180,000 to 250,000 because Carlier gives no information about Mw/Mn ratios” (page 11, lines 16-19).

25. Examiner finds this argument to be unpersuasive. Separate from any of disclosure (or lack thereof) regarding Mw/Mn ratios, Carlier teaches a Mw range of 150,000 to 300,000 while the instantly claimed Mw range is 180,000 to 250,000. These ranges are not considered to be patentably distinct. It has been held that “a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness” (*In re Peterson*, 65 USPQ2d 1379, 1382-83).

26. Applicant further argues regarding Mw/Mn ration that “there is no reasonable likelihood (other than perhaps with the benefit of hindsight) that the person of ordinary skill might have selected Harclerode’s non-preferred range” (page 12, lines 5-6).

27. Examiner finds this argument to be unpersuasive. Harclerode teaches “the polymer generally exhibits a polydispersity of from about 1 to less than 2.5.” (column 17, lines 41-42). Disclosed examples and preferred embodiments do not constitute a

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teaching away from a broader disclosure or non-preferred embodiment. (*In re Susi*, 169 USPQ 423) Also, it has been held that a reference is not limited to its preferred embodiment, but must be evaluated for all of its teachings, including its teachings of non-preferred embodiments. (*In re Burckel*, 201 USPQ 67) Thus one of ordinary skill would have considered polymers with the polydispersity instantly claimed because Harclerode teaches that polymers of the type discussed generally have exhibit polydispersity from about 1 to less than 2.5.

28. Applicant appears to be arguing that one of ordinary skill in the art would not consider "white oil" as taught by Berghmans to be in the same class of materials as the petroleum wax taught by Carlier because a reverse search from "white oil" does not lead directly to the "Paraffin" reference applied above (pages 12-13).

29. Examiner finds this argument to be unpersuasive. As applied in the rejection above, Carlier teaches a plasticizer which is a petroleum wax (column 11, lines 32-34) and where "the petroleum was...selected from the paraffin waxes" (column 5, lines 57-58). One of ordinary skill in the art would clearly look for further information on paraffin and paraffin waxes when presented with the specific material characteristics presented in the instant claims.

30. As explained above, it is well known in the art, as evidenced by the "Paraffin" reference that paraffins exist in both solid and liquid forms and that liquid paraffins are commonly referred to as mineral oils (paragraph 0001). Berghmans discloses the use of "white oil" as a plasticizer (column 6, line 23) which, as applicant has noted is an alternative name for mineral oils. Thus examiner considers that it would have been

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obvious to one of ordinary skill in the art at the time of the invention to try to substitute the liquid paraffin plasticizer of Berghmans for the solid paraffin plasticizer of Carlier as they are both known to be useful as plasticizers for forming expanded polymer beads and are the same class of materials. It has been held to be obvious to one of ordinary skill to pursue known options when it does no more than yield predictable results. See *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385. It has been held to be within the ordinary skill of a worker in the art to select a known material on the basis of its suitability for the intended use. See *Sinclair & Carroll Co. v. Interchemical Corl.*, 325 US 327, 65 USPQ 297 (1945).

31. Finally applicant argues that “the reliance on five documents to support the assertion that the claimed invention is obvious is direct evidence of *ex-post facto* analysis” (page 13, lines 12-13).

32. In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Conclusion

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISON HINDENLANG whose telephone number is (571)270-7001. The examiner can normally be reached on Monday to Friday 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/YOGENDRA GUPTA/

Supervisory Patent Examiner, Art Unit 1744

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